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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,122	10/22/2001	Jenoe Tihanyi	WMP-SME-519	7094

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EXAMINER

WARREN, MATTHEW E

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 12/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/033,122

Applicant(s)

TIHANYL, JENOE

Examiner

Matthew E. Warren

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AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-11 is/are rejected.
- 7) ☒ Claim(s) 3,4 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 5, 6, and 8-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Ueno (US 6,512,268 B1).

In re claim 1, Ueno shows (fig. 1) a field effect controllable semiconductor component comprising a semiconductor body including a first surface (top surface of substrate layer 12), a first layer (11) of a first conduction type (n), and a second layer (drift layer 12) of the first conduction type (n drift regions) lying above the first layer. A first terminal zone (14) can be contact-connected at the first surface of the semiconductor body and is formed in the second layer. A channel zone (13a) of the second conduction type (p) surrounds the first terminal zone. Compensation zones (12b and 12c) of the second conduction type (p) are formed in the second layer. A second terminal zone (top portion of layer 12l) of the first conduction type (n), which is formed in the second layer, can be contact-connected at the first surface of the

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semiconductor body if a portion of the top insulating layer (19) is removed and a contact is formed upon that second terminal zone.

In re claim 2, Ueno shows (fig. 1) that a connecting zone (lower portion of 12l) is located between the second terminal zone and the first layer. None of the compensation zones are formed in the connecting zone (12l).

In re claim 5, Ueno shows (fig. 1) that the first layer (11) of semiconductor body is doped more heavily (n+) than the second layer (12 having n doping).

In re claim 6, Ueno shows (fig. 1) that the semiconductor body has an edge (right side) and the second terminal zone (12l) is formed at the edge of the semiconductor body.

In re claim 8, Ueno shows (fig. 1) that the compensation zones (12b and 12c) adjoin the channel zones (13a).

In re claim 9, Ueno shows (fig. 1) that the compensation zones are designed in pillar form and extend vertically in the second layer.

In re claim 10, Ueno shows (fig. 1) that the second layer includes a number of charge carriers of the first conduction type and a number of charge carriers of the second conduction type that are approximately the same magnitude since the n and p regions of the n drift regions 12a and the p compensation regions 12b and 12c each have moderate n and p doping.

In re claim 11, Ueno shows (fig. 1) that a control electrode (16) adjacent the channel zone is insulated from the semiconductor body by dielectric (15).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno (US 6,512,268 B1) as applied to claim 1 above, and further in view of Neilson et al. (US 6,455,442).

In re claim 7, Ueno shows all of the elements of the claims except the electrically conductive layer connecting the first layer and the second terminal zone on the side of the semiconductor body. Neilson et al. shows (fig. 10) a semiconductor device in which an electrically conductive layer is connected to the first layer of the device (lower substrate layer connected to 78) and a second terminal zone (70). The semiconductor body has a side area to which an electrically conductive layer is applied. With the configuration of forming the drain contact away from the gate contact, a latching current is increased (col. 4, lines 45-48). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the second terminal zone of Ueno by forming an electrically conductive layer on the side of the semiconductor body as taught by Neilson to increase a latching current in the device.

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Allowable Subject Matter

Claims 3, 4, and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art references do not show the limitations of claims 3 and 12 in that the connection zone is doped more heavily than the remaining regions of the second layer.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Deboy et al. (US 6,479,876 B1), Ahlers et al. (US 6,639,272 B2), and Hara et al. (JP 2002-124675A) also show semiconductor devices having compensation zones formed in the substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Warren whose telephone number is (703) 305-0760. The examiner can normally be reached on Mon-Thurs, and alternating Fri, 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3432.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Matthew E. Warren


December 12, 2003